MUCO-DIS: A new AFM-based nanoscale dissolution technique

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Video Byte

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Abstract

Mucoadhesion is a powerful mode of drug delivery. Prolonged exposure to mucosal tissue allows for drug release over an extended period of time, improving both compliance with drug treatment and convenience of use among patients. Unfortunately, there is no standard method for evaluating the performance of different mucoadesive drug formulations. Now, there's MUCO-DIS, developed by University of Huddersfield. MUCO-DIS is an AFM- and microfluidics-based system that simultaneously measures four core functional properties of mucoadhesive formulations at the nanoscale: mucoadhesion force, 3D surface topography, polymer dissolution, and drug release characteristics. Researchers at University of Huddersfield used this newly developed MUCO-DIS to evaluate the performance of metformin mucoadhesive formulation. The system not only provided accurate information about the mucoadhesion force, polymer dissolution, and drug release, but also revealed differences in texture and performance between different mucosal surfaces, including gastric, intestinal and buccal tissues. The results suggest that the MUCO-DIS system could be a valuable tool for evaluating popular mucoadhesive drug formulations and perhaps even adapted to evaluate other materials with real-time nanoscale precision.